

# Salt Management Strategy: Non-Traditional BMP Workgroup

## Comparison of Salt Management Certification Programs

This memo provides a comparison of four [salt management certification training programs selected by the Non-Traditional BMPs workgroup](#). These programs were selected for further comparison from a larger set of programs reviewed as these four programs appear, based upon readily available information, to be transferable to Virginia and also covers recommended best management practices (BMPs) identified by the Traditional BMPs workgroup. The programs reviewed are:

1. Accredited Snow Contractors Association (ASCA) Certification
2. American Public Works Association (APWA) Winter Maintenance Supervisor Certification
3. Smart About Salt Council (SASC) Certification
4. Sustainable Winter Management (SWiM) Certification

This comparison is on the extent to which each program covers environmental impacts (Section 1), economic benefits (Section 2), and the [set of BMPs](#) identified by the Traditional BMPs workgroup (Section 3). Note that the intent of this document is to provide a broad overview of each program and is not an endorsement of any program reviewed. Additionally, the information provided in this review may not identify the full extent of a program's offering, due to limited details on the programs' websites on the content of information covered by the trainings as the material is often proprietary and there is a fee for participating in trainings and receiving materials. For the SASC, ASCA, and APWA programs the information presented below was gathered from the organizations' websites. The SWiM information is based upon a phone interview with the program's founder Phill Sexton. This task builds on an [initial review of ten certification programs](#).

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## Section 1. Environmental Impacts

### ASCA Certification

Environmental impacts are covered in a variety of the ASCA courses but are not the focus of this program.

### APWA Winter Maintenance Supervisor Certification Programs

Environmental issues associated with chemicals and abrasives are both discussed during the certification programs. This covers corrosion, damage to vegetation, soil, waterbodies (including sources of drinking water), aquatic life, and air quality.

### SASC Certification

SASC's training begins with a section titled, "The Environmental Effects of Salt." It covers the effects of excessive salt on soil, vegetation, surface water and its biota, wildlife, and groundwater. It also covers [Environment Canada's](#) perspective on salt management.

### SWiM Certification

SWiM certification is different from the other programs discussed in this document. This program focuses on property owners and managers, and to a more limited extent, municipalities, and how to practically implement training so that salt use and reductions can be quantified. To this end, recognition of the environmental impacts of salt use are embedded in an organization's decision to have their facility or roads SWiM certified.

## Section 2. Economic Benefits of Practices

### ASCA Certification

This topic is not covered during training.

### APWA Winter Maintenance Supervisor Certification Programs

This program only briefly discussed this topic in the context of that economic losses due to closed roads exceeds the cost of snow removal.

### SASC Certification

This topic does not appear to be covered during training.

### SWiM Certification

Cost reduction is a goal of the program. It specializes in GPS tracking of salt use so the rate of application is always known allowing for changing costs to be tracked. The program's website promotes its ability to prevent delayed business openings, thus protecting revenue.

### Section 3. Best Management Practices

The list of BMP categories in this section are those supported by the Traditional BMPs workgroup. The complete list and discussion can be found in their paper, [SaMS: Operational Best Management Practices – Pros & Cons](#).

Table 1. Summary of BMP Coverage in Certification Training Courses.

<b>BMP</b>	<b>ASCA</b>	<b>APWA</b>	<b>SASC</b>	<b>SWiM</b>
Plowing Practices	X	X	X	X
Calibration	X	X	X	X
Measurement	X	X	X	X
Level of Service	Unknown	X	No	X
Training	X	X	X	X
Anti-Icing	Unknown	X	X	X
Liquids	X	X	X	X
Application Practices, Varying Application Rates, Use of Deicers at Cold Temperatures	X	X	X	X
Pre- and Post-Storm Meetings to Review Plans and Performance	X	X	X	X
Weather Forecasting/Surface Temperature Information	Unknown	X	X	X
Enhanced Equipment/Technology	X	X	X	X
Salt Storage and Handling	No	X	X	X
Winter Maintenance Planning	X	X	X	X
Accountability/Tracking and Reporting	X	X	X	X

Additional Practices	Training courses are tailored to private contractors and, specifically, how to reduce their liability. There are many courses dedicated to meeting industry standards.	Contracting guidelines, liability and risk management, safety, management skills and tips, interacting with the public and media, driver's licenses and training.	None identified	None identified
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### 3.3 ASCA Certification

Specific information on the content covered in the many course offerings is not available. The list of courses can be found on the [ASCA website, and are offered in a series of 5 levels \(100 through 500\)](#). Initial certification requires that all ten 100-level courses are completed. The information below summarizes readily available information from the program's website. In all cases, this is not a comprehensive representation of the training.

#### *Plowing Practices*

Based upon course titles, this topic may be addressed under "Snow Management Basics" and/or "Ice Management Basics."

#### *Calibration*

Based upon course titles, this topic may be addressed under "Snow Management Basics" and/or "Ice Management Basics."

#### *Measurement*

Course offered that covers this topic, but specifics of the course are unknown.

#### *Level of Service*

Based upon course titles, unknown if this program addresses this topic.

#### *Training*

Course offered that covers this topic, but specifics of the course are unknown.

#### *Anti-Icing*

Course offered that covers this topic, but specifics of the course are unknown.

#### *Liquids*

Course offered that covers this topic, but specifics of the course are unknown.

#### *Application Practices, Varying Application Rates, Use of Deicers at Cold Temperatures*

Course offered that covers this topic, but specifics of the course are unknown.

#### *Pre- and Post-Storm Meetings to Review Plans and Performance*

Course offered that covers this topic, but specifics of the course are unknown.

#### *Weather Forecasting/Surface Temperature Information*

Based upon course titles, unknown if this program addresses this topic.

#### *Enhanced Equipment/Technology*

Course offered that covers this topic, but specifics of the course are unknown.

#### *Salt Storage and Handling*

Based upon course titles, unknown if this program addresses this topic.

#### *Winter Maintenance Planning*

Course offered that covers this topic, but specifics of the course are unknown.

#### *Accountability/Tracking and Reporting*

Course offered that covers this topic, but specifics of the course are unknown.

### 3.4 APWA Winter Maintenance Supervisor Certification Programs

APWA's training is coordinated through the organization's chapters. For Virginia, any training would be hosted by the Mid-Atlantic Chapter. There is a fee to hold a standalone training, as well as any meeting facility and speaker costs. Trainings are also often conducted in association with APWA conferences. In addition to the eight-hour supervisor training reviewed here, a four-hour operator training is also available.

Information on this training program comes from a handout provided to training attendees (APWA 2019). As stated, the goal of the programs is "more effective, efficient, equitable & environmentally-friendly snow & ice control." Topics covered include:

- Policy and planning
- Weather
- Materials
- Equipment and fleet
- Snow and ice control

The information below summarizes what is covered during the training and sometimes includes details of what is presented. In all cases, this is not a comprehensive representation of the training.

#### *Plowing Practices*

The various types of plows (one-way, two-way/reversible, V, underbody, wing), plow blades, controllers, and hydraulic systems are discussed as well as how to select the one best-suited for local needs. Operational speed for plowing, special snow operations (multi-modal areas, gravel roads), optimizing routes, and using automatic vehicle locations systems are also covered during training.

#### *Calibration*

APWA's main message regarding calibration is that it is important to know what and how much is being applied.

### *Measurement*

This is taught as part of the discussion about how to calibrate equipment.

### *Level of Service*

The level of service determined is the “desired, usually achievable, condition of pavement surface.”

### *Training*

Training at all staff levels is encouraged.

### *Anti-Icing*

The difference between anti-icing and de-icing is explained, as well as the benefits of anti-icing: Reduced material usage and effort. Details on how anti-icing works, how to account for pavement temperature, when it should be used, and how to calculate how much material is needed are provided.

### *Liquids*

It is recommended that the material selected should meet the level of service needed and account for “societal, economic, and environmental concerns.” The training course presentation includes general information on liquids and selecting the appropriate material. In addition to what is covered in this training, APWA offers four additional courses on liquids. These are offered as in-person trainings and as recordings for APWA members.

### *Application Practices, Varying Application Rates, Use of Deicers at Cold Temperatures*

The APWA training covers application practices, including variable application rates, in breadth and depth. Highlights are conditions for using direct liquid application, the benefits of pre-treating salt, recommendation to plow first, and encouragement to check pavement temperature before applying salt.

### *Pre- and Post-Storm Meetings to Review Plans and Performance*

Both how to prepare for a storm and review actions taken during one are explained. Additionally, adjusting operations during a storm as needed is also recommended.

### *Weather Forecasting/Surface Temperature Information*

The basics of weather and forecasting are taught as well as how this interacts with road conditions. The benefits of using advanced forecasts for winter road maintenance is also explained.

### *Enhanced Equipment/Technology*

A number of enhanced equipment and technologies are discussed including:

- Mobile sensors,
- Road Weather Information System (RWIS),
- Maintenance Decision Support System (MDSS) forecasts, and
- New types of equipment: dual blade, tow plows, expandable plows, ice breakers, satellite assisted GPS controller, alternative fuel fleets.

### *Salt Storage and Handling*

The reasons for proper storage and handling and best practices for doing so are covered in detail.

### *Winter Maintenance Planning*

APWA training covers the planning cycle by activities that need to occur during each season. The use of a written plan is encouraged.

#### *Accountability/Tracking and Reporting*

Setting performance measures and how to track them are taught. This is discussed in large part in relation to the use of automatic vehicle location systems.

#### *3.1 SASC Certification*

The [SASC Training Workbook](#) for operators and winter maintenance contractors covers most of the BMPs endorsed by the Traditional BMPs workgroup. The information below summarizes readily available information from the program's website. In all cases, this is not a comprehensive representation of the training.

#### *Plowing Practices*

Suggests that mechanical removal should be the first approach to snow removal. The training covers the benefits of doing so and how to best do it.

#### *Calibration*

Topics covered in this section are "the importance of calibration, how to calibrate equipment, how often to calibrate, and the importance of documentation."

#### *Measurement – Measuring Deicer Use*

This is covered during training. No additional details are available.

#### *Level of Service*

Based upon readily available information, it does not appear this topic is covered..

#### *Training*

In addition to the training described in this section for operators and winter maintenance contractors, SASC provides a similar training for facility owners and operators.

#### *Anti-Icing*

This program covers this topic and the various materials for winter road maintenance.

#### *Liquids*

The workbook provides guidelines for when it is and is not appropriate to use anti-icing/Direct Liquid Application (DLA). Training covers how one can make his or her own liquid, document procedure, and concentration made. Emphasis is placed on the best temperatures to use each liquid and the advantages and disadvantages of each. The liquids discussed during training are:

- Salt Brine (Sodium Chloride) (23.3%)
- Magnesium Chloride (various concentrations)
- Calcium Chloride (36.0%)
- Agricultural blends mixed with above liquids
- Sugar beets (exclusively mixed with salt brine)
- Corn (mixed with Magnesium Chloride)

#### *Application Practices, Varying Application Rates, Use of Deicers at Cold Temperatures*

Application practices are in terms of the “5 Rs of Salt Management.” The “5 Rs” are “Right material,” “Right time,” “Right amount,” “Right place,” “Retain it.” The benefits of having the option for low, medium, and high application rates are discussed. Also covered are how to calculate the amount of salt needed for a given area and the corresponding application rate.

#### *Pre- and Post-Storm Meetings to Review Plans and Performance*

Participants are encouraged to have these meetings to review performance and to proactively address known issues.

#### *Weather Forecasting/Surface Temperature Information*

SASC training covers the essential weather conditions to monitor and the different types and sources of forecasts.

#### *Enhanced Equipment/Technology*

The need to invest in new equipment is discussed in order to implement advanced winter maintenance techniques.

#### *Salt Storage and Handling*

General procedures for storage and handling are discussed, as well as how to treat solids and liquids differently.

#### *Winter Maintenance Planning*

How to conduct a site assessment is covered. The goal of this assessment is to identify high-risk areas and estimate salt requirements.

#### *Accountability/Tracking and Reporting*

This topic is covered under the training’s section on Risk Management and Record-Keeping. An example of a daily log sheets is provided and discussed.

### **3.2 SWiM Certification**

All of the BMPs are covered as part of the SWiM program. A 100-point matrix of policy guidelines is used to ensure that winter maintenance materials use is optimized (Sexton 8/27/19). The program is focused around a target application rate, working to reduce it, and verifying material use via technology. The information below summarizes information obtained from a phone interview with the program’s founder. In all cases, this is not a comprehensive representation of the training.

#### *Plowing Practices*

Topic covered by this program, but specifics are unknown.

#### *Calibration*

Topic covered by this program, but specifics are unknown.

#### *Measurement*

Topic covered by this program, but specifics are unknown.

#### *Level of Service*

Topic covered by this program, but specifics are unknown.



#### *Training*

Topic covered by this program, but specifics are unknown.

#### *Anti-Icing*

Topic covered by this program, but specifics are unknown.

#### *Liquids*

Topic covered by this program, but specifics are unknown.

#### *Application Practices, Varying Application Rates, Use of Deicers at Cold Temperatures*

Topic covered by this program, but specifics are unknown.

#### *Pre- and Post-Storm Meetings to Review Plans and Performance*

Topic covered by this program, but specifics are unknown.

#### *Weather Forecasting/Surface Temperature Information*

Topic covered by this program, but specifics are unknown.

#### *Enhanced Equipment/Technology*

Topic covered by this program, but specifics are unknown.

#### *Salt Storage and Handling*

Topic covered by this program, but specifics are unknown.

#### *Winter Maintenance Planning*

Topic covered by this program, but specifics are unknown.

#### *Accountability/Tracking and Reporting*

Topic covered by this program, but specifics are unknown.

## References

1. Accredited Snow Contractors Association. 2016. Course Selection. <http://learning.ascaonline.org>. Accessed 8/21/2019.
2. American Public Works Association. 2019. APWA's Winter Maintenance Supervisor Certificate Workshop (workshop handout).
3. Sexton, Phill. WIT Advisors. Personal Communication. August 27, 2019.
4. Smart About Salt Council. 2018. Training Workbook. <http://www.smartaboutsalt.com/resources/Documents/Training%20Workbook%2020180222v3.pdf>. Accessed 8/21/2019.